

Listing of the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Previously Presented) A method of routing a flow of frames through a switch comprising:

receiving at least one frame from said flow of frames;

applying a process to select an exit port of said switch from a set of possible exit ports through which at least one frame from said flow of frames will exit to potentially reduce frame traffic congestion along potential routes that include said set of possible exit ports, said set of possible exit ports including at least some of the exit ports of at least two trunk groups; and

transmitting said at least one frame.

2. (Original) The method of claim 1, wherein said set of possible exit ports includes at least all of the exit ports of at least two trunk groups.

3. (Original) The method of claim 1, wherein at least one of said trunk groups comprises four exit ports.

4. (Original) The method of claim 1, wherein at least one of said trunk groups comprises eight exit ports.

5. (Original) The method of claim 1, wherein said process comprises a pseudo-random process.

6. (Original) The method of claim 5, wherein applying said pseudo-random process comprises applying a hash function.

7. (Original) The method of claim 6, wherein said hash function is applied to a set of parameters associated with the frames exiting said switch in order to select an exit port from said set of possible exit ports.

8. (Previously Presented) The method of claim 1, wherein a weight is respectively assigned to at least some respective ones of said exit ports; and

wherein applying a process to select an exit port of said switch from a set of possible exit ports through which a frame from said flow of frames will exit to potentially reduce frame traffic congestion along potential routes that include said set of possible exit ports comprises employing the weights to select an exit port that is as good as or better than alternative exit ports in terms of achieving an objective function reflected by said weights.

9. (Original) The method of claim 8, wherein as good as or better in terms of achieving an objective function comprises obtaining a higher value objective function.

10. (Original) The method of claim 8, wherein as good as or better in terms of achieving an objective function comprises obtaining a lower value objective function.

11. (Original) The method of claim 8, wherein said weights at least in part reflect consumed bandwidth for particular routes.

12. (Previously Presented) The method of claim 8, wherein at least some exit ports have multiple weights reflecting routes from the particular exit port to multiple respective destination ports; and

wherein applying a process to select an exit port from a set of possible exit ports through which a frame from said flow of frames will exit to potentially reduce frame traffic congestion along potential routes that include said set of possible exit ports comprises employing said multiple weights to select an exit port that is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

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13. (Original) The method of claim 12, wherein as good as or better in terms of achieving an objective function comprises obtaining a higher value objective function.

14. (Original) The method of claim 12, wherein as good as or better in terms of achieving an objective function comprises obtaining a lower value objective function.

15. (Original) The method of claim 12, wherein said multiple weights at least in part reflect consumed bandwidth for particular routes.

16. (Cancelled)

17. (Previously Presented) The method of claim 1, wherein at least one of said set of possible exit ports is selected based at least in part on a source tag and/or a destination tag added to said at least one frame after said at least one frame enters said switch.

18. (Previously Presented) The method of claim 17, wherein said source tag and/or said destination tag is stripped off said at least one frame before said at least one frame exits said switch.

19. (Previously Presented) The method of claim 1, wherein at least one of said set of possible exit ports is selected based at least in part on a source tag and/or a destination tag added to each of said at least one frames after said at least one frames enter said switch.

20. (Previously Presented) The method of claim 19, wherein said source tag and/or said destination tag is stripped off each of said at least one frames before each of said at least one frames exits said switch.

21. (Previously Presented) A switch fabric comprising:

at least a first switch and a second switch;

said first and said second switch being communicatively coupled;

said first switch including a processor and a memory, and balancing a flow of frames exiting said first switch; and

said first switch selecting an exit port of said switch from a set of possible exit ports through which a frame from said flow of frames will exit to potentially reduce frame traffic congestion along potential routes that include said set of possible exit ports, said set of possible exit ports including at least some of the exit ports of at least two trunk groups.

22. (Original) The switch fabric of claim 21, wherein at least one of said trunk groups comprises four exit ports.

23. (Original) The switch fabric of claim 21, wherein at least one of said trunk groups comprises eight exit ports.

24. (Previously Presented) The switch fabric of claim 21, wherein said first switch selects said exit port pseudo-randomly.

25. (Previously Presented) The switch fabric of claim 24, wherein said first switch selects said exit port pseudo-randomly by applying a hash function.

26. (Previously Presented) The switch fabric of claim 25, wherein said first switch applies said hash function to a set of parameters associated with the frames that will exit said first switch.

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27. (Previously Presented) The switch fabric of claim 21, wherein said first switch is adapted to respectively assign a weight to at least some respective ones of said exit ports; and

wherein said first switch is adapted to employ the weights to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said first switch so that said selected exit port is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

28. (Original) The switch fabric of claim 27, wherein as good as or better in terms of achieving an objective function comprises obtaining a higher value objective function.

29. (Original) The switch fabric of claim 27, wherein as good as or better in terms of achieving an objective function comprises obtaining a lower value objective function.

30. (Previously Presented) The switch fabric of claim 27, wherein said weights at least in part reflect consumed bandwidth for particular routes.

31. (Previously Presented) The switch fabric of claim 27, wherein at least some exit ports have multiple weights to reflect routes from the particular exit port to multiple respective destination ports; and

wherein said first switch employs said multiple weights to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said first switch to select an exit port that is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

32. (Previously Presented) The switch fabric of claim 31, wherein said multiple weights at least in part reflect consumed bandwidth for particular routes.

33. (Original) The switch fabric of claim 31, wherein as good as or better in terms of achieving an objective function comprises obtaining a higher value objective function.

34. (Original) The switch fabric of claim 31, wherein as good as or better in terms of achieving an objective function comprises obtaining a lower value objective function.

35. (Cancelled)

36. (Previously Presented) The switch fabric of claim 21, wherein said first switch selects at least one of said set of possible exit ports based at least in part on a source tag and/or a destination tag added to said at least one frame after said at least one frame enters said switch.

37. (Previously Presented) The switch fabric of claim 36, wherein said first switch strips said source tag and/or said destination tag off said at least one frame before said at least one frame exits said switch.

38. (Previously Presented) The switch fabric of claim 21, wherein said first switch selects at least one of said set of possible exit ports based at least in part on a source tag and/or a destination tag added to each of said at least one frames after said at least one frames enter said switch.

39. (Previously Presented) The switch fabric of claim 38, wherein said first switch strips said source tag and/or said destination tag off each of said at least one frames before each of said at least one frames exits said switch.

40. (Previously Presented) An apparatus comprising:
a switch, said switch including a processor and a memory;
said switch further balancing a flow of frames exiting said switch; and
said switch selecting an exit port of said switch from a set of possible exit ports
through which a frame from said flow of frames will exit to potentially reduce frame
traffic congestion along potential routes that include said set of possible exit ports, said
set of possible exit ports including at least some of the exit ports of at least two trunk
groups.

41. (Original) The apparatus of claim 40, wherein at least one of said trunk
groups comprises four exit ports.

42. (Original) The apparatus of claim 40, wherein at least one of said trunk
groups comprises eight exit ports.

43. (Previously Presented) The apparatus of claim 40, wherein said switch
selects said exit port pseudo-randomly.

44. (Previously Presented) The apparatus of claim 43, wherein said switch
selects said exit port pseudo-randomly by applying a hash function.

45. (Previously Presented) The apparatus of claim 44, wherein said switch
applies said hash function to a set of parameters associated with the frames that will exit
said switch.

46. (Previously Presented) The apparatus of claim 40, wherein said switch
respectively assigns a weight to at least some respective ones of said exit ports; and
wherein said switch employs the weights to select an exit port for a frame of said
flow of frames to exit to balance said flow of frames exiting said switch so that said
selected exit port is as good as or better than alternative exit ports in terms of achieving
an objective reflected by said weights.

47. (Original) The apparatus of claim 46, wherein as good as or better in terms of achieving an objective function comprises obtaining a lower value objective function.

48. (Original) The apparatus of claim 46, wherein as good as or better in terms of achieving an objective function comprises obtaining a higher value objective function.

49. (Original) The apparatus of claim 46, wherein said weights at least in part reflect consumed bandwidth for particular routes.

50. (Previously Presented) The apparatus of claim 46, wherein at least some exit ports have multiple weights to reflect routes from the particular exit port to multiple respective destination ports; and

wherein said switch employs said multiple weights to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said switch to select an exit port that is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

51. (Original) The apparatus of claim 50, wherein as good as or better in terms of achieving an objective function comprises obtaining a lower value objective function.

52. (Original) The apparatus of claim 50, wherein as good as or better in terms of achieving an objective function comprises obtaining a higher value objective function.

53. (Original) The apparatus of claim 50, wherein said multiple weights at least in part reflect consumed bandwidth for particular routes.

54. (Cancelled)

55. (Previously Presented) The apparatus of claim 41, wherein said switch selects at least one of said set of possible exit ports based at least in part on a source tag and/or a destination tag added to said at least one frame after said at least one frame enters said switch.

56. (Previously Presented) The apparatus of claim 55, wherein said switch strips said source tag and/or said destination tag off said at least one frame before said at least one frame exits said switch.

57. (Previously Presented) The apparatus of claim 40, wherein said switch selects at least one of said set of possible exit ports based at least in part on a source tag and/or a destination tag added to each of said at least one frames after said at least one frames enter said switch.

58. (Previously Presented) The apparatus of claim 57, wherein said switch strips said source tag and/or said destination tag off each of said at least one frames before each of said at least one frames exits said switch.

59. (Previously Presented) A network comprising:
a host;
a physical storage unit; and
a first switch and a second switch communicatively coupled to form a switch fabric;
said first switch and said second switch further communicatively coupled to said host and said physical storage unit;
at least said first switch including a processor and memory, and balancing a flow of frames exiting said switch; and
said first switch selecting an exit port of said switch from a set of possible exit ports through which a frame from said flow of frames will exit to potentially reduce frame traffic congestion along potential routes that include said set of possible exit ports, said set of possible exit ports including at least some of the exit ports of at least two trunk groups.

60. (Original) The network of claim 59, wherein at least one of said trunk groups comprises four exit ports.

61. (Original) The network of claim 59, wherein at least one of said trunk groups comprises eight exit ports.

62. (Previously Presented) The network of claim 59, wherein said first switch selects said exit port pseudo-randomly.

63. (Previously Presented) The network of claim 62, wherein said first switch selects said exit port pseudo-randomly by applying a hash function.

64. (Previously Presented) The network of claim 63, wherein said first switch applies said hash function to a set of parameters associated with the frames that will exit said first switch.

65. (Previously Presented) The network of claim 59, wherein said first switch is adapted to respectively assign a weight to at least some respective ones of said exit ports; and

wherein said first switch employs the weights to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said first switch so that said selected exit port is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

66. (Original) The network of claim 65, wherein as good as or better in terms of achieving an objective function comprises obtaining a lower value objective function.

67. (Original) The network of claim 65, wherein as good as or better in terms of achieving an objective function comprises obtaining a higher value objective function.

68. (Original) The network of claim 65, wherein said weights at least in part reflect consumed bandwidth for particular routes.

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69. (Previously Presented) The network of claim 65, wherein at least some exit ports have multiple weights to reflect routes from the particular exit port to multiple respective destination ports; and

wherein said first switch employs said multiple weights to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said first switch to select an exit port that is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

70. (Original) The network of claim 69, wherein as good as or better in terms of achieving an objective function comprises obtaining a lower value objective function.

71. (Original) The network of claim 69, wherein as good as or better in terms of achieving an objective function comprises obtaining a higher value objective function.

72. (Original) The network of claim 69, wherein said multiple weights at least in part reflect consumed bandwidth for particular routes.

73. (Cancelled)

74. (Previously Presented) The network of claim 59, wherein said first switch selects at least one of said set of possible exit ports based at least in part on a source tag and/or a destination tag added to said at least one frame after said at least one frame enters said first switch.

75. (Previously Presented) The network of claim 74, wherein said first switch strips said source tag and/or said destination tag off said at least one frame before said at least one frame exits said first switch.

76. (Previously Presented) The network of claim 59, wherein said first switch selects at least one of said set of possible exit ports based at least in part on a source tag and/or a destination tag added to each of said at least one frames after said at least one frames enter said first switch.

77. (Previously Presented) The network of claim 76, wherein said first switch strips said source tag and/or said destination tag off each of said at least one frames before each of said at least one frames exits said first switch.

78. (Previously Presented) A computer-readable storage medium having stored thereon computer-executable instructions that, when executed, result in performance of a method of balancing a flow of frames exiting a switch that includes the following:

applying a process to select an exit port of said switch from a set of possible exit ports through which a frame from said flow of frames will exit to potentially reduce frame traffic congestion along potential routes that include said set of possible exit ports, said set of possible exit ports including at least some of the exit ports of at least two trunk groups.

79. (Previously Presented) The computer-readable storage medium of claim 78, wherein at least one of said trunk groups comprises four exit ports.

80. (Previously Presented) The computer-readable storage medium of claim 78, wherein at least one of said trunk groups comprises eight exit ports.

81. (Previously Presented) The computer-readable storage medium of claim 78, wherein said instructions, when executed, further result in: said process comprising a pseudo-random process.

82. (Previously Presented) The computer-readable storage medium of claim 81, wherein said instructions, when executed, further result in: said applying said pseudo-random process comprises applying a hash function.

83. (Previously Presented) The computer-readable storage medium of claim 82, wherein said instructions, when executed, further result in: said hash function being applied to a set of parameters associated with the frames exiting said switch.

84. (Previously Presented) The computer-readable storage medium of claim 78, wherein said instructions, when executed, further result in: a weight being respectively assigned to at least some respective ones of said exit ports; and further result in: applying a process to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said switch comprising employing the weights to select an exit port that is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

85. (Previously Presented) The computer-readable storage medium of claim 84, wherein said instructions, when executed, further result in: said weights at least in part reflecting consumed bandwidth for particular routes.

86. (Previously Presented) The computer-readable storage medium of claim 84, wherein said instructions, when executed, further result in: at least some exit ports having multiple weights reflecting routes from the particular exit port to multiple respective destination ports; and further result in: applying a process to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said switch comprising employing said multiple weights to select an exit port that is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

87. (Previously Presented) The computer-readable storage medium of claim 86, wherein said instructions, when executed, further resulting in: multiple weights at least in part reflecting consumed bandwidth for particular routes.

88. (Previously Presented) The computer-readable storage medium of claim 78, wherein said instructions, when further executed, result in: at least one of said set of possible exit ports being selected based at least in part on a source tag and/or a destination tag added to said at least one frame after said at least one frame enters said switch.

89. (Previously Presented) The computer-readable storage medium of claim 88, wherein said instructions, when further executed, result in: said source tag and/or said destination tag being stripped off said at least one frame before said at least one frame exits said switch.

90. (Previously Presented) The computer-readable storage medium of claim 78, wherein said instructions, when further executed, result in: at least one of said set of possible exit ports being selected based at least in part on a source tag and/or a destination tag added to each of said at least one frames after said at least one frames enter said switch.

91. (Previously Presented) The computer-readable storage medium of claim 90, wherein said instructions, when further executed, result in: said source tag and/or said destination tag being stripped off each of said at least one frames before each of said at least one frames exits said switch.

92. (Previously Presented) A computer-readable storage medium having stored thereon computer-executable instructions that, when executed, result in a method of initializing a switch to route a flow of frames comprising:

initializing said switch to apply a process to select an exit port of said switch from a set of possible exit ports through which a frame from said flow of frames will exit to potentially reduce frame traffic congestion along potential routes that include said set of possible exit ports, said set of possible exit ports including at least some of the exit ports of at least two trunk groups.

93. (Previously Presented) The computer-readable storage medium of claim 92, wherein said instructions, when executed, further result in: said switch being initialized to apply a pseudo-random process.

94. (Previously Presented) The computer-readable storage medium of claim 93, wherein said instructions, when executed, further result in: said switch being initialized to apply a hash function being to a set of parameters associated with frames exiting said switch.

95. (Previously Presented) The computer-readable storage medium of claim 92, wherein said instructions, when executed, further result in: said switch being initialized to assign a weight to at least some respective ones of said exit ports; and said switch being initialized to apply a process to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said switch comprising employing the weights to select an exit port that is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.